

REMARKS

Claims 1-35 are currently pending in the subject application, and are presently under consideration. Claims 12-24 are allowed. Claims 1-3, 8-10, 12, 25 and 29-31 stand rejected. Claims 4-7, 11, 26-28, 32-35 have been indicated as allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims. Favorable reconsideration of the application is requested in view of the comments herein.

I. Interview Summary

Applicants' representative greatly appreciates the courtesy and consideration extended by Examiner Phan during a telephonic interview on November 20, 2007.

During the interview, independent claims 1 and 25 were discussed relative to U.S. Patent No. 7,222,220 to Cypher, et al. ("Cypher") in view of U.S. Patent Application Publication No. 2002/0129211 to Arimilli, et al. ("Arimilli"). Agreement was reached with the Examiner on several points. It was agreed that Cypher fails to teach or suggest a conflict response, as recited in claim 1. Agreement was also reached that Arimilli does not teach or suggest a conflict response indicating that an ordering point for the data is migrating according to a second cache coherency protocol, as also recited in claim 1.

Regarding claim 25, agreement was reached that the subject matter recited is similar to that recited in claim 4, which depends from claim 1 and was previously indicated as containing allowable subject matter. In particular, neither Cypher nor Arimilli, individually or in combination, teaches or suggests the system of claim 25.

This response has been prepared based on the discussion with the Examiner, including the understandings and agreements reached, during the telephonic interview on November 20, 2007.

II. Rejection of Claims 1, 2-3, 8-10, 12, 25, 29-31 under 35 U.S.C. 103

Claims 1, 2-3, 8-10, 12, 25, 29-31 have been rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Patent No. 7,222,220 to Cypher, et al. ("Cypher") in view of U.S. Patent Application Publication No. 2002/0129211 to Arimilli, et al. ("Arimilli"). Applicant traverses this rejection for the following reasons.

The Office Action fails to establish that Cypher teaches a conflict response. The Office Action cites sections of Cypher that describe functionality of a mode unit 250 to determine a transmission mode; namely, Point-to-Point ("PTP") or Broadcast ("BC") mode. See Cypher col. 7, line 25, to col. 8, line 27. No part of the functionality taught by Cypher, however, relates to a second node that provides a conflict response to a second request, as recited in claim 1. In claim 1, it is a home node that provides a second request for the data based on a first request for such data that is requested by first node. In contrast, the cited section of Cypher (Cypher col. 7, line 25, to col. 8, line 27) and Cypher more generally does not include the particular interrelationship between requests and the conflict response recited in claim 1. That is, Cypher generally fails to teach methods for indicating that a conflict that has occurred, especially (as discussed below) not the particular type of conflict response that is the subject of claim 1. Instead, the determination made by the mode control unit 250 in Cypher relates to determining (by the mode control unit 250) which mode (PTP or BC) a second request is to be sent. For example, in situations where congestion is high or a particular region is not widely shared or is read-only, the PTP mode can be selected. Cypher at Col. 7, lines 50-58. Regardless of the circumstances that are used to determine which mode to use for issuing a request, such functionality taught by Cypher does not correspond to providing a conflict response that is provided by a second node within the meaning of claim 1.

The Office Action admits that Cypher fails to disclose a second node that provides the conflict response indicating that an ordering point for the data is migrating according to a second cache coherency protocol. Office Action at page 2, section 4, lines 10-12. This admission is quite reasonable for the reasons discussed above.

As discussed during the telephonic interview, Arimilli fails to cure the deficiencies of Cypher because Arimilli fails to disclose that a node provides a conflict response indicating that an ordering point for the data is migrating, as recited in claim 1. The Office Action cites to sections of Arimilli that teach combined responses (CR) inform an agent that issued a transaction whether or not it "won" the arbitration performed by the coherency decision point (CDP). See Arimilli para. [0026] and [0032]. Arimilli further provides definitions of possible types of combined responses in Tables II and III of Arimilli. Significantly, none of the combined

responses taught in Arimilli is a conflict response that indicates that an ordering point for the data is migrating. See Arimilli table III.

Additionally, fundamental differences between claim 1 and the teachings of Arimilli become apparent when the response logic of Arimilli that provides the combined responses is considered relative to the system of claim 1. The system of claim 1 recites a particular relationship of request and responses provided by a home node, a first node and a second node. According to Arimilli, the coherency decision point (CDP) can be in the home node or a separate device. Arimilli at para. [0030]. The CDP provides the combined response based on a set of responses received, which responses are provided responsive to one or more requests for a target cache line that is (significantly) held in a shared state. Arimilli at para. [0030]. Plainly, no combined response disclosed in Arimilli indicates that an ordering point is migrating.

For the reasons discussed above, Applicant requests reconsideration and allowance of claim 1. Claims 2-3, 8-10, and 12 depend from claim 1 and are also patentable.

Additionally, regarding claim 2, the Office Action cites a section of Arimilli wherein the master node has lost the arbitration for ownership of the target cache line. See Arimilli para. [0043]. Thus, in contrast to claim 2, the node issuing the RETR SR taught by Arimilli is not the home node because it has not won the arbitration for ownership of the cache line. Additionally, Arimilli teaches that the node which won the request issues a Kill transaction, which further is not a retry request. Therefore, Arimilli fails to teach that the home node provides a retry request in response to the conflict response (discussed supra.). Accordingly, Applicant requests reconsideration and allowance of claim 2.

Regarding claim 3, the Office Action cites a section of Arimilli that fails to disclose a node requests or receives a copy of the data since the transactions being processed by the CDP relate to data that is already cached in a shared state at the node. See, e.g., Arimilli Abstract, para. [0011] and [0043]. Since Arimilli discloses systems that arbitrate between conflicting responses to modify data already cached in a shared state, one of ordinary skill in the art would also recognize that the system of Arimilli would not employ a response that includes a copy of the data as provided in the system of claim 3. See Arimilli Abstract. Accordingly, applicant requests reconsideration and allowance of claim 3.

Claim 25 is patentable for reasons similar to claims 1 and 4. Claim 25 is written in means-plus-function format and recites features similar to those in the system of claim 4, which the Office Action had indicated as containing allowable subject matter. For example, each of Cypher and Arimilli fail to teach or suggest means for transitioning a cache state at a first processor node from an ownership state to a transition state associated with migration of an ordering point for the data from the first processor node in response to a request for the data according to a first cache coherency protocol, as recited claim 25. This generally because no means is provided in either Cypher or Arimilli to identify that an ordering point is migrating as recited in claim 25. The means for issuing the first snoop and means for issuing a second snoop further recite features similar to those of claim 1, which in combination with the means for transitioning recite a system that is not taught or suggested in claim 25. Accordingly, claim 25 is patentable and its allowance is respectfully requested.

Claims 29 and 30 depend from claim 25 and are patentable for at least the same reasons as claim 25.

Claim 31 is patentable for similar reasons to those discussed with respect to claim 1. Additionally, one of ordinary skill in the art would not combine the teachings of Arimilli with the teachings of Cypher to perform the method of claim 31 because Arimilli teaches that the data is already shared in the caches of the nodes. Thus, the retry request in Arimilli would not be combined with Cypher to provide a snoop request for the data, since the node in Arimilli already has a copy of the data. See Arimilli abstract. Accordingly, Applicant requests reconsideration and allowance of claim 31.

III. Allowable Subject Matter

Claims 12-24 have been indicated as being allowed.

Claims 4-7, 11, 26-28, 32-35 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Applicant respectfully requests withdraw of the objections to dependent claims 4-7, 11, 26-28, 32-35, at least for the reasons given in support of the independent claims from which they depend.

IV. CONCLUSION

In view of the foregoing remarks, Applicant respectfully submits that the present application is in condition for allowance. Applicant respectfully requests reconsideration of this application and that the application be passed to issue.

Should the Examiner have any questions concerning this paper, the Examiner is invited and encouraged to contact Applicant's undersigned attorney at (216) 621-2234, Ext. 106.

No additional fees should be due for this response. In the event any fees are due in connection with the filing of this document, the Commissioner is authorized to charge those fees to Deposit Account No. 08-2025.

I hereby certify that this correspondence is being transmitted to the U.S. Patent and Trademark Office via electronic filing on December 3, 2007.

Respectfully submitted,

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